Geotrichum fragrans, Geotrichum gracile, Geotrichum heritum, Geotrichum klebaknii, Geotrichum penicillatum, Geotrichum hirtum, Geotrichum pseudocandidum, Geotrichum rectangulatum, Geotrichum suaveolens, Geotrichum vanryiae, Geotrichum loubieri, Geotrichum microsporum, Cladosporium sap., Trichoderma sap., Trichoderma hamatum, Trichoderma harzianum, Trichoderma koningii, Trichoderma pseudokoningii, Trichoderma reesei, Trichoderma virgatum, Trichoderma viride, Oidium sap., Alternaria sap., Alternaria alternata, Alternaria tenuis, Helminthosporium sap., Helminthosporium gramineum, Helminthosporium sativum, Helminthosporium teres, Aspergillus sap., Aspergillus ochraseus, Aspergillus nidulans, Aspergillus versicolor, Aspergillus wentii Group, Aspergillus candidus, Aspergillus flavus, Aspergillus niger, Aspergillus oryzae strain ATCC 14156, Penicillum sap., Penicillum aculeatum, Penicillum citrinum, Penicillum claviforme, Penicillum funiculosum, Penicillum italicum, Penicillum lanoso-viride, Penicillum emersonii, Penicillum lilacinum, Penicillum expansum and mixtures thereof.

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REMARKS

I. Introduction.

Applicants and their attorneys thank the Examiner for the interview on August 14, 2001. As a result of the interview, independent claims 1, 13, 18, 27, 48 and 64 have been amended to reflect a range of activated spores which are mixed with the cereal which is in the malting process of the invention. Moreover, the claims have been amended to compare the enzymatic activity of a malting process which includes the mixing of cereal with dormant spores versus the mixing of a cereal with activated spores according to the invention. This has been done to show that the process of the invention produces clearly different

results from the process described in the Gyllang reference which mixes cereal with dormant spores.

This amendment also includes declarations and argument concerning the Examiner's position as to (1) the deposit of microorganisms (this as now been done as per the declaration of James P. Krueger), (2) the Examiner's "enablement" rejection at paragraphs 5 -9 of the last office action, and (3) the Examiner's anticipation and obviousness rejection of the last office action.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made**".

II. Pending Independent Claims

After this amendment the pending independent claims are 1, 13, 18, 27, 48, 64 and new independent claims 65, 70 and 77.

III. The Range In Independent Claims 1, 13, 18, 27, 48 And 64 Has A Basis At Page 13, Second Full Paragraph.

The amendment to the pending independent claims to reflect a range for the amount of activated spores mixed with the cereal in the process of the invention clearly obviates the Examiner's rejection directed to the lack of such an upper limit. This has been done not because the upper limit is critical to the invention (the upper limit of the amount of activated spores being mixed with the cereal is only a practical and economic question[1]), but to overcome what the Examiner believes to be a objection to the claims under section 112 of the Patent Code. As a matter of expediency, applicants have amended independent claims 1, 13, 18, 27, 48 and 64, have added new claim 65, but ask

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[1]As explained to the Examiner, one would not add so many activated spores to make the process not economic or make the malting cereal a goo of cereal and spores.

the Examiner to reconsider his position as to new independent claims 70 and 79. In any event, the amendment of independent claims 1, 13, 18, 27, 48 and 64 obviates the Examiner's second section 112 rejection at paragraph 3 of the last office action.

Applicants ask the Examiner to reconsider his rejection, especially in view of the new claims which state the lower limit and "effective for" language which has long been accepted in the patent law. In re Halleck, 164 USPQ 647 (1970).

IV. The Deposit Requirement Have Been Met And The Declaration Of James P. Krueger Obviates The Rejection Based Upon Lack Of Deposit.

The following microorganisms are on deposit with the American Type Culture Collection:

a) Rhizopus Oryzae NRRL 1427, now assigned PTA-3670;

b) Rhizopus Oryzae NRRL 1891, now assigned PTA-3671;

c) Rhizopus Oryzae ATCC 4858, now assigned PTA-3627;

d) Aspergillus Oryzae ATCC 14156, now assigned PTA-3628; and

e) Rhizopus Oryzae ATCC 9363, now assigned PTA-3629.

V. The Art and Articles As Of The Time Of The Filing Of This Application Teach How To Activate Spores.

Activation is the start of germination. See Medwid et al. "Germination Of Rhyzopus oligospores etc.", Applied and Environmental Microbiology 1984 p. 1067-1071, at the Abstract, (the Examiner already has this article). Further, the Examiner agreed that if an organism is on deposit, it can be germinated and is enabled. The following organisms described in the claims are on deposit which deposit is confirmed by the declaration of James P. Krueger.

Micrococcus spp., Streptococcus spp., Leuconostoc spp., Pediococcus spp., Pediococcus halophilus, Pediococcus cerevisiae,

Pediococcus damnosus, Pediococcus parvulus, Pediococcus soyae, Lactococcus spp., Lactobacillus spp., Lactobacillus acidophilus, Lactobacillus amyllovorus, Lactobacillus bifermentans, Lactobacillus brevis var lindneri, Lactobacillus casei var casei, Lactobacillus delbrueckii, Lactobacillus delbrueckii var lactis, Lactobacillus delbrueckii var bulgaricus, Lactobacillus fermenti, Lactobacillus gasserii, Lactobacillus helveticus, Lactobacillus hilgardii, Lactobacillus sake, Lactobacillus kefir, Lactobacillus pentoceticus, Lactobacillus cellobiosus, Lactobacillus buchneriik, Lactobacillus coryneformis, Lactobacillus confusus, Lactobacillus viridescens, Corynebacterium spp., Propionibacterium spp., Bifidobacterium spp., Streptomyces spp., Bacillus spp., Sporolactobacillus spp., Acetobacter spp., Agrobacterium spp., Alcaligenes spp., Pseudomonas cocovenenans, Pseudomonas pseudomallei, Gluconobacter spp., Enterobacter spp., Erwinia spp., Klebsiella spp., Proteus, spp., Mycosphaerella spp., Venturia spp., Monascus spp., Emericilla spp., Euroteum spp., Eupenicillilum spp., Neosartorya spp., Talaromyces spp., Hypocrea spp., Dipodascus spp., Galactomyces spp., Endomyces spp., Metschnikowiaceae, Guilliermondella spp., Debaryomyces spp., Dekkara spp., Pichiia spp., Kluyveromyces spp., Saccharomyces spp., Torulaspora spp., Zygosaccharomyces spp., Hanseniaspora spp., Schizosaccharomyces spp., Chaetomium spp., Neurospora spp., Absidia spp., Amylomyces spp., Rhizomucor spp., Actinomucor spp., Thermomucor spp., Chlamydomucor spp., Mucor spp., Mucor circinelloides, Mucor grisecyanus, Mucor hiemalies, Mucor indicus, Mucor mucedo, Mucor piriformis, Mucor plumbeus, Mucor pusillus, Mucor silvaticus, Mucor javanicus, Mucor racemosus, Mucor rouxianus, Mucor rouxil, Mucor aromaticus, Mucor flavus, Mucor miehel, Rhizopus spp., Rhizopus arrhizus, Rhizopus oligosporus, Rhizopus oryzae, Rhizopus oryaze strain ATCC 4858, oryzae strain ATCC 9363, Rhizopus oryzae strain NRRL 1891, Rhizopus oryzae strain NRRL 1472, Rhizopus stolonifer, Rhizopus

thailandensis, Rhizopus formosaensis, Rhizopus chinensis, Rhizopus cohnii, Rhizopus japonicus, Rhizopus deiemar, Rhizopus acetorinus, Rhizopus chlamydosporus, Rhizopus circinans, Rhizopus javanicus, Rhizopus peka, Rhizopus saito, Rhizopus tritici, Rhizopus niveus, Rhizopus microsporus, Aureobasidium spp., Acremonium spp., Cercospora spp., Epicoccum spp., Monillia spp., Monillia candida, Mycoderma spp., Candida spp., Candida diddensiae, Candida edax, Candida etchellsii, Candida kefir, Candida krisei, Candida lambica, Candida melinil, Candida milleri, Candida mycoderma, Candida parapsilosis, Candida obtux, Candida tropicalis, Candida valida, Candida versatilis, Candida guillermondii, Rhodotorula spp., Torulopsis spp., Geotrichum spp., Geotrichum amycellium, Geotrichum armillariae, Geotrichum asteroides, Geotrichum bipunctatum, Geotrichum dulcitum, Geotrichum eriense, Geotrichum fici, Geotrichum flavo-brunneum, Geotrichum fragrans, Geotrichumgracile, Geotrichum penicillatum, Geotrichum hirtum, Geotrichum pseudocandidum, Geotrichum rectangulatum, Geotrichum loubieri, Geotrichum microsporum, Cladosporium spp., Trichoderma spp., Trichoderma hamatum, Trichoderma harzianum, Trichoderma koningli, Trichoderma pseudokoninglii, Trichoderma reesei, Trichoderma virgatum, Trichoderma viride, Oidium spp., Altermaria spp., Altermaria alternata, Altermaria tenuis, Helminthosporium spp., Helminthosporium gramineum, Helminthosporium sativum, Helminthosporium teres, Aspergillus spp., Aspergillus ochraseus, Aspergillus nidulans, Aspergillus versicolor, Aspergillus wentii Group, Aspergillus candidus, Aspergillus flavus, Aspergillus niger, Aspergillus oryzae strain ATCC 14156, Penicillum spp., Penicillum aculeatum, Penicillum citrinum, Penicillum claviforme, Penicillum funiculosum, Penicillum italicum, Penicillum lanoso-viride, and Penicillum liiacinum.

The articles located in a review of the literature and pertinent portions of the articles which are attached to the declaration of James P. Krueger discuss how to germinate and/or activate the microorganisms at the "tab #s" noted below.

Bacillus spp. Turian Table 2 (no page #) #8
General Microbiology pg. 75 #10

Venturia spp. Fungal Physiology, Griffin Table 1, pg 262, #9 describes water content, and how to germinate.

Saccharomyces spp. Fungal Physiology, Griffin Table 1, pg 262, #9 describes water content, and how to germinate.

Neurospora spp. The Fungal Spore, Weber, pg. 124 # 6
The Fungi Ainsworth pg 754 #4
Smith et al. Filamentous Fungi Table 18.1 pg 359 #7.

Mucor miehel Smith et al. Filamentous Fungi Table 18.1 pg 359 #7.
The Fungal Spore, Weber, pg. 111 # 6

Rhizopus spp. The Fungi Ainsworth pg 746 #4

Rhizopus arrhizus Ekundayo, the Examiner already has article.

Rhizopus oligosporus, Medwid, the Examiner already has article.

Rhizopus oryzae, specification page 15.

Rhizopus chinensis, Physiology of Fungi, Cochrane, pg 406, Table 3, # 2.

Rhizopus delemar Fungal Physiology, Griffin Table 4, pg 275, #9

Aspergillus spp., Physiology of Fungi, Cochrane, pg 404-405, humidity specified, # 2.

Tsay et al Transient Effect of Exogenous etc., article describes germination conditions, #12.

Aspergillus nidulans, Osherov et al., (2001 article), see pages 154, 156 and 157, #11.

Aspergillus niger, The Fungus Spore, Madelin pg. 159 # 5

Smith et al. Filamentous Fungi Fig. 18.2 pg 365 #7.

Aspergillus oryaze, Specification

The Fungi Ainsworth pg 746 #4

Penicillum spp., Physiology of Fungi, Cochrane, pg 404-405, # 2.

In view of the numerous articles and in view of the deposit of the numerous microorganisms named above, there is no doubt that activation as described in the claims and the specification of the instant application is enabled (see attached declaration of Coppens dated 9/11/01) and the applicants respectfully request that the "enablement" rejection under section 112 of the Patent Code be withdrawn.

VI. Gyllang Does Not Anticipate The Claimed Invention.

Gyllang could only potentially anticipate the claimed invention if Gyllang mixed activated spores with his cereal. The past declarations, the scientific literature and close analysis

of Gyllang conclusively prove that he did not mix activated spores into his cereal to malt it.

(a) Activation is not proven by actual spore size, it is shown by relative size before and after activation.

Because in at least one instance the experiment described in the Coppens declaration of February 1, 2001 produced spores larger than the size predicted by Pitt and Hocking, the Examiner speculates that this evidences that the spores produced in the experiment and also used by Gyllang were activated. The declaration and observation of spores conclusively proves that the spores were not activated. Activation is not proven by actual spore size, it is shown by relative size before and after activation. When put into the context that activation is an initial phase of germination[2], one should understand why the Coppens declaration is proof that the spores added by Gyllang to his cereal were not activated. In the February 1, 2001 declaration, Mr. Coppens states,

"17. Several examples in the literature show that spore swelling as a result of spore activation is a slow process. Depending on the organism and activation conditions, the onset of activation has been reported to occur after 1 hour (see Ekundayo and Carlile, 1964, and Fig. 1 therein) or after 2.5 to 3.5 hours (see Medwid et al., 1984, and Fig. 3 therein). In the same studies, swelling of the spores continued at least until respectively 8 hours and 4 hours of incubation before reaching a maximum. Consequently, we are correct in accepting the spore size measured immediately (i.e., within minutes) after homogenization of the spores in the growth medium, as the dormant spore size, and to evaluate spore activation by the increase in spore size in a time frame between 0 and 6 hours after homogenization. This is especially the case where there was no statistical increase in spore size after 6 hours at 20°C and 42°C

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[2]Medvid, the article already cited to the Examiner says in its Abstract that gemination is in two phases I. Swelling (which starts in the presence of a suitable carbohydrate); then II. Germ tube protrusion. He writes about optimization of germination conditions for **Rhizopus Oligospores.**

and no germination tubes were observed after such time at such temperatures."

Because the spores did not continue to grow after 6 hours at 20°C and 42°C and no germination tubes were observed after such time and at such temperatures, this is clear and conclusive evidence that Gyllang did not add activated spores to his cereal. Moreover, Gyllang himself describes his spores as "metabolically inactive" at page 252 of his article.

(b) The literature varies on its report of spore size for a species and one report of a spore size does not prove that all spores of a given species has have a single size.

The literature which discusses dormant spore size does not report identical spore sizes for the same spores, so even if one did not chose to believe Coppens (which the Examiner can not do without substantial evidence), the literature also is not sufficiently precise to say that if a spore diameter is a stated number of microns, it is activated. See Tab 1, page 704, which reports a Rhizopus Oryzae spore size of (4)-6-8(-12)x(3-)4.5-6(-8) microns vs Pitt and Hocking which reports a size of 5-8 microns.

(c) Close analysis of what Gyllang did to his spores also confirms that Gyllang's spores were dormant (and confirms Gyllang's own description of his spores as metabolically inactive).

Spores grow as if they were fruit on a small tree. During growth, the spores become remote from the nutrient and become dormant at the time of harvest. Gyllang put his spores into a peptone, yeast abstract and dextrose medium and grew them for three weeks. His spores grew as fruit on a tree and became remote from the nutrient medium and/or the medium may have become exhausted. As a result, the spores become dormant. See attached declaration of Coppens dated 9/11/01. Reference to the attached

flow chart illustrates the cycle.[3] If the spores were activated at the time of Gyllang's homogenization and then addition to the cereal, they would have at least gown a germ tube after 6 hours at 20°C and 42°C. But as stated by Coppens in his declaration no such germination tubes were observed after such time at such temperatures.

Clearly Gyllang did not add activated spores to his cereal and Gyllang does not anticipate the claimed invention.

VII. Gyllang Does Not Render The Claimed Invention Obvious.

(a) Mixing activated spores with cereal provides greater enzymatic activity compared to mixing dormant spores in the cereal.

Gyllang states he added metabolically inactive spores to his malting mix. He stated:

- the spores were metabolically inactive (see page 252 of Gyllang; and
- the number of added spores were not important (see page 252 of Gyllang).

The data in specification of this application proves a significant difference between the enzymatic activity of cereal malted with activated spores compared to Gyllang's dormant spores. See attached declaration of Coppens dated 9/11/01. The specification at page 20, Example I describes the activation of Rhizopus oryzae on TSB at pH 4 with an incubation for 5-6 hours at 42C°. The specification reports the following enhanced enzymatic activity using activated spores.

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[3]The flow chart assumes Gyllang obtained his spores from the ATCC and grew them for about 7 days before he then grew them for three weeks. Also as will be discussed below, because the reference lacks detail, Gyllang can not be precisely duplicated, especially at the point where he added spores to his cereal. The Coppens February 1, 2001 declaration describes only the growing and harvesting spores which is Coppens' best estimate of what Gyllang actually did to prepare his spores.

	A_1	B_1	C_1	D_1
	Traditional	Non Activated	Activated	Activated
β glucanase	214	371	683	3856
Xylanase	28	34	56	984

Example 3 at page 27 of specification further describes the activation of Rhizopus oryzae and the following enhanced enzyme activity.

	A_3	B_3	C_3
	Traditional	Non Activated	Activated
β glucanase	202	931	1322
Xylanase	43	65	71

This data confirms the viability of the invention which contemplates mixing activated spores with a cereal in sufficient quantity to improve enzymatic activity of the malt. (See page 13 of specification). The activated spores permit the production of enzymes which provide this improved activity. (See page 13 of specification).

The art does not teach or suggest introducing activated spores into cereal. The art does not teach mixing water, a cereal and activated spores and holding the combination for a time and temperature effective to increase enzymatic activity relative to a combination without activated spores. (See page 6 of the specification for support; also see page 30 [top] for support.) The art does not teach mixing water, activated spores and cereal:

- to use the activated spores to increase enzymatic activity over a blend without activated spores.
- a base level of $1X10^2$ per gram of dry cereal of activated spores. (See page 13 of specification for support.

The invention contemplates loading malting environment with activated spores to create a new and unexpected enzymatic activity that does not exist without the use of activated spores or even with the use of dormant spores. Applicants have never denied that Gyllang might produce some amount of activated spores during his malting process, but as shown by the above data, relying on the production of activated spores during the malting process is too little too late to produce an enhanced enzymatic activity as claimed.

The new claims further distinguish Gyllang because the increased enzyme activity is defined as being greater than the enzyme activity which is obtained by a malting process with spores which are not activated.

At page 248, Gyllang states:

> "It is obvious, therefore, that the three fungi possess proteolytic, amylolytic and other carbohydrate-splitting enzymes which give noticeable effects under the conditions prevailing during the malting process."

That phenomenon is not new. The specification at page 3 cites WO 94/29430, The European Brewery Convention, volume 16, 1977. Also see WO 94/16053. The key to the instant invention is the addition of activated spores.

At page 252 of Gyllang, Gyllang states:

> "On the other hand, the actual number of spores is probably of less importance than other factors since the spores themselves are metabolically inactive. It is instead the conditions prevailing during the germination period which are decisive-conditions which permit the spores to grow and develop mycelium with a high degree of activity which can affect the composition of the barley kernel."

In contrast to the present invention, Gyllang did not consider the number of spores he added as important. Increasing the number of spores might be considered as analogous to activation of spores. If the number of spores was not important as taught by Gyllang, one would not be taught by Gyllang to add

activated spores. Rather Gyllang focused on germination conditions with dormant spores which the data in the applicants' specification show are clearly not as important as the addition of activated spores. The amended claims clearly distinguish the phenomenon described by Gyllang of possibly developing an activity during malting with inactivated spores. The invention "gets more faster" because it uses activated spores, see examples 1 and 3 in the specification. This proves patentability.

Gyllang does not create a prima facie case of obviousness. He denies he uses activated spores, but rather states he uses metabolically inactive spores. The February 1, 2001 declaration also proves he added dormant spores. Further, one of ordinary skill would not expect his malting process to have a substantially enhanced activity if one were to add not only dormant spores, but also mycelium as a part of the addition of dormant spores to the malting cereal. Finally, even if Gyllang did create a prima facie case of obviousness, because of the lack of detail in his description of his malting process, that process could not be duplicated to prove a lack of enzymatic activity. See declaration of Coppens dated 9/11/01. Gyllang does not report the amount of spores and the concentration of spores which he added to his barley. We do not know how many spores he grew after three weeks in the Peptone. We do not know the volume of steep water in the second steep when Gyllang added the dormant spores. In short, the data showing dormant spores in the Coppens declaration and the data shown in the specification showing the enhanced enzymatic activity created by activated spores over dormant spores is the best experimental data available to show the significant and unexpected results of the invention over the use of dormant spores. This data shows the non-obviousness of the applicants' invention.

VII. Conclusion.

In view of the foregoing materials, declarations and amended claims, applicants respectfully request reconsideration and allowance of the pending claims.

Respectfully submitted,

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"Version with Markings to Show Changes Made"

1. (Three Times Amended) A process for the preparation of a malted cereal comprising: introducing activated spores in an amount of [at least] about 1 X 10^2 to about 1 X 10^7 per gram per gram of dry cereal to a cereal before or during a malting process, the activated spores being present on the cereal in an amount which is effective for providing the malted cereal with an increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by the same malting process but with dormant spores.

13. (Twice Amended) A process for the preparation of a malted cereal said process comprising:

(a) introducing activated spores in an amount of from about 1 X 10^2 to about 1 X 10^7 per gram per gram of dry cereal into a moistened cereal to form a moistened cereal/activated spore combination;

(b) germinating the cereal in the moistened cereal/activated spore combination to provide a germinated cereal, the activated spores being present in the cereal in an amount which is effective for providing the germinated cereal with an increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by the same malting process but with dormant spores; and

(c) drying said germinated cereal.

18. (Twice Amended) A process for the preparation of a malted cereal said process comprising: mixing water, a cereal and activated spores to provide a moistened cereal/activated spore combination, the activated spores in an amount of from about 1 X 10^2 to about 1 X 10^7 per gram per gram of dry cereal, and holding

moistened cereal/activated spore combination for a time and at a temperature, the amount of the activated spores, holding time and holding temperature effective for providing the malted cereal with an [increase in] increased activity of an enzyme compared to the activity of an enzyme obtained by moistening and mixing the cereal [without activated] with dormant spores.

27. (Twice Amended) A process for the preparation of malted cereal comprising:

steeping the cereal, the steeping including one or more wetting stages at a temperature between about 5° to about 30°C, the wetting stages effective for providing a material having a moisture content between about 20% and about 60% by weight;

germinating the cereal in the presence of activated spores for about 2 to about 7 days at a temperature between about 10° to about 30°C, to provide a germinated cereal[;],

[adding] the activated spores being from microbes selected from the group consisting of bacteria, fungi, and mixtures thereof and being added to the cereal prior to or during the steeping or the germinating of the cereal, the activated spores being present in an amount of from about 1 X 10^2 to about 1 X 10^7 per gram per gram of dry cereal and being present in the cereal in an amount which is effective for providing the germinated cereal with an increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by the same malting process but with dormant spores;

drying the steeped and germinated cereal at a temperature of from about 40° to about 150°C until the steeped and germinated cereal has a moisture content between about 2% to about 15% by weight.

48. (Once Amended) A method for the preparation of a malted cereal product, the method comprising:

mixing water, activated spores and a cereal to provide a malting cereal composition, [wherein said activated spores increase an activity of an enzyme that is present in a cereal used during said malting process and] the activated spores being [are] present in the malting cereal composition in an amount of [at least] about 1 X 10^2 to about 1 X 10^7 per gram of air dry cereal, the amount of activated spores being effective for providing the malted cereal with the increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by the same malting process [without activated] but with dormant spores.

56. (Once Amended) A method for the preparation of a malted cereal, the method comprising:

mixing water, activated spores and a cereal to provide a malting cereal composition, the activated spores being present in an amount of [at least] about 1 x 10^2 to about 1 X 10^7 per gram of air dry cereal to provide a [malting] malted cereal [composition], the amount of activated spores being effective for providing the malted cereal with an increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by a malting process dormant spores.

64. (Once Amended) A method for the preparation of a malted barley, the method comprising:

mixing activated spores, a barley and water to provide a malting barley composition, the activated spores being present in an amount of [at least] about 1 x 10^2 to about 1 X 10^7 per gram of air dry barley to provide a malting barley composition, the amount of activated spores being effective for providing an increased enzyme activity greater than the enzyme activity which

is obtained by the same malting process which includes dormant spores and wherein the increased enzyme activity is selected from the group of β-glucanase, xylanase, amylase, Protease, naturally occurring enzymes in the barley and combinations thereof;

holding the malting barley composition at a temperature of from about 5°C to about 30°C for a time effective for providing a wetted barley having a moisture content of at least about 20 weight percent,

[the activated spores increasing an activity of an enzyme that is present in the barley used during said malting method, the activated spores being present in the malting barley composition in an amount which is effective for providing the malted barley with the increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by a malting process without activated spores, wherein the enzyme is selected from the group of β-glucanase, xylanase, amylase, Protease, naturally occurring enzymes in the barley and combinations thereof,] and

wherein the activated spores are activated by treatments selected from the group consisting of

cycles of wetting and drying,

addition of nutritional supplies,

exposure to temperature changes within a range of about 0° to about 80°C,

exposure to changes in pH within a pH range of about 2.0 to about 8.0 to obtain spores where the size of the spores is increased by a factor between about 1.2 and about 10 over their dormant size and/or the spores have one or more germ tubes per spore, and mixtures thereof.